

A Request To Make Drawing Amendments, wholly responsive to the Examiner's comments at paragraph 2 of the Office Action.

Applicants have also amended the Specification to clearly define item 81 of the drawing figures, which drawing figures are now believed to fully comply with 37 CFR 1.84(p) (5).

Claims 1-10 are amended hereby.

Response To Rejections Under 35 USC § 102

Claims 1-5 and 7 were rejected under 35 USC § 102(e) as unpatentable by US Patent No. 6,213,638 to Rattner. The Examiner asserts that Rattner discloses an x-ray device with a source 2, and detector 3 mounted on a common holding device 1, connected to a supporting device 5 comprising a plurality of hinged serially interconnected supporting members 7 as a robot arm to position completely (b, alpha, beta). The Examiner further asserts that the individual supporting members may be individually controlled (g) while the holding device in the form of the C-arm is connected to the holding device by way of a hinge (4 and beta).

In response, applicant respectfully asserts that Banister does not anticipate claims 1-5 and 7 for at least the following reasons.

Applicant's claim 1 sets forth an X-ray device provided with an X-ray source and an X-ray detector which are mounted at a respective end of a common holding device, the holding device being connected to the room by way of a supporting device, wherein the supporting device is composed of a plurality of hinged, serially interconnected supporting members.

As applicants understand, Rattner's element 5 is not a supporting device comprising a plurality of hinged serially interconnected supporting members as a robot arm to position, as set forth in applicants' claim 1. More particularly, Rattner at col. 6, lines 8-9 states that Rattner's element 5 comprising an image intensifier arranged under the patient support table 3.

Rattner, therefore, does not anticipate claim 1 for at least that reason. It follows that because claims 2-5 and 7 depend from claim 1, Rattner does not anticipate claims 2-5 and 7. Hence, applicant asserts that each of claims 1-5 and 7 are not unpatentable under 35 USC section 102(a) in view of Rattner, and respectfully request withdrawal of the rejection of those claims thereunder.

RESPONSE TO REJECTIONS UNDER 35 USC § 103

Claim 6 was rejected in the Office Action under 35 USC § 103(a) as obvious by Rattner in view of US Patent No. 3,784,837 to Holmstrom. The Examiner asserts that Rattner discloses applicants' device as recited, but not a holding device including at least two holding members for the source and detector, that Holmstrom discloses a holding device including at least two holding members as seen in Holmstrom's Fig. 1, that the skilled artisan would be motivated to combine the two references to realize the ability to freely move the source around the patient.

Applicant respectfully disagrees that Rattner discloses applicants' device. Moreover, applicants disagree that Holmstrom discloses at Fig. 1 two holding members for the source and detector.

Applicants' claim 6 sets forth an X-ray device as claimed in claim 1, wherein the holding device is composed of at least two holding members, the X-ray source is being mounted on a first holding member and the X-ray detector is mounted on a second holding member.

Rattner teaches an image intensifier 5 arranged under the patient support table. Applicants assert, with all due respect, that the Examiner may have misunderstood Rattner's image intensifier to include a supporting device comprising a plurality of interconnected supporting members. Hence, Rattner is incorrectly asserted to include a plurality of interconnected supporting members.

Holmstrom's Fig. 1 discloses an x-ray tube 1 and an x-ray image amplifier 2 which are hung by a single stand 3 from the ceiling 4. The stand consists of a column 5, bracket 7 swingable upon the column about a horizontal axle 6, a carrying arm 9 for the x-ray tube 1, where the arm is mounted upon one end of the bracket and being swingable about horizontal axle 8 extending parallel to axle 6, and a carrying arm 11 for the x-ray image amplifier 2 located at the other end of the bracket 7 and swingable about horizontal axle 10 also extending parallel to axle 6. The x-ray tube and the x-ray image intensifier about horizontal axles 12, 13, which axles are also parallel to axle 6. The stand 3 is attached to the ceiling to be rotatable about vertical axis 15. Holmstrom's Fig. 1 does not show a holding device including at least two holding members. Holmstrom's Fig. 1 merely shows what is described above.

Rattner does not teach or suggest applicants' supporting member. Moreover, even were Rattner to disclose applicants' device, as asserted by the Examiner, combining Holmstrom with Rattner would still not realize a device such as that set forth in applicants' claim 6.

For that matter, there is no teaching or suggestion in either reference for combining the references, still less for combining the references to realize a device to move an x-ray source freely around the patient. There is no inference or suggestion of same purpose in either reference, nor any suggestion in either reference that either recognizes a need for moving the x-ray source freely about a patient. Still further, the desirability of a feature of applicants' claims does not render the feature obvious, and as mentioned, a careful reading of both references fails to realize any such teaching or suggestion.

It follows that claim 6 is not obvious by Rattner in view of Holmstrom under 35 USC § 103(a), and applicant respectfully requests withdrawal of the claim rejection thereunder.

Claims 1-7 were rejected under 35 USC section 103(a) in the Office Action over applicants' admitted prior art in view of US Patent No. 4,894,855 to Kresse, that applicants admitted prior art recites all of applicants' elements but for a single manipulator, Kresse discloses the manipulator and it would have been obvious to use Kresse's single manipulator for a C-arm device because "forming one piece of an article formally formed in two pieces is obvious.

In response applicants respectfully assert that their devices of claims 1-7 do not require "two pieces" as assertedly set forth shown in Kresse. The Examiner clearly asserts that Kresse discloses a single manipulator, so it is unclear to applicants what the Examiner is asserting with respect to "two pieces" which are shown in Kresse and thought to be combined by applicants to realize the manipulator.

Applicants' claim 1 is set forth above. Each of Kresse's support means shown in its figure includes a base with a motor for moving a robot arm connected either to the wall, ceiling or floor. Each supporting means includes a first lever connected to the base to permit rotational and pivotal movement by the motor, and a second lever connected to the first lever pivotable by the motor. There is no correspondence between Kresse's structure and the manipulator set forth in applicants' claim 1. Rattner does not disclose applicants' device as claimed.

Accordingly, applicants respectfully assert that one skilled in the art would not read Kresse and applicants' admitted prior art, and see that their combination would realize an invention such

as that set forth by applicants' claim 1. For that matter, there is nothing in applicants' disclosure or Kresse which would teach or suggest combining same to realize an invention such as set forth in claim 1. Hence, applicants respectfully assert that the Examiner may be inadvertently using hindsight to support the rejections, asserts that claim 1, is not obvious over the combined references, and request withdrawal of the claim 1 rejection, and the rejections to claims 2-7 which depend therefrom, and requests withdrawal of the rejections to claims 1-7 under Section 103(a) therefore.

Claims 8-10 were rejected in the Office action under Section 103(a) by Rattner in view of US Patent No. 4,987,583 to Travanty, et al. (Travanty), and US Patent No. 6,213,638 to Rattner II), that Rattner II discloses the claim 1 device but for an ultrasonic or mechanical contact sensor to monitor distance between the examined object and the source or detector. The Examiner further asserts that Travanty discloses such a sensor, and that it would be obvious to prepare the Travanty sensor with the Rattner detectors and the Rattner II x-ray device to avoid having the examined object form being hit with the source or detector.

Applicants respectfully disagree.

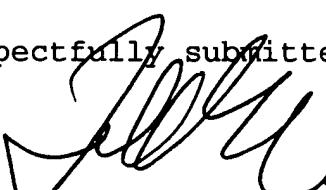
Applicants' claim 8 sets forth an X-ray device as claimed in claim 1, such that there are provided means for monitoring the distance between an object to be examined and moving parts of the X-ray device, notably the X-ray source and the X-ray detector. Applicants' claim 9 sets forth the X-ray device as claimed in claim 8, wherein the means for monitoring the distance are provided with

ultrasound sensors and ultrasound detectors. Applicants' claim 10 sets forth the X-ray device as claimed in claim 8, wherein the means for monitoring the distance include mechanical contact sensors.

There is not teaching or suggestion for combining the three references to realize an invention as set forth in any of applicants' claims 8-10. Furthermore, because of the above stated deficiencies of Rattner, even combining the three references would not realize the devices as claimed.

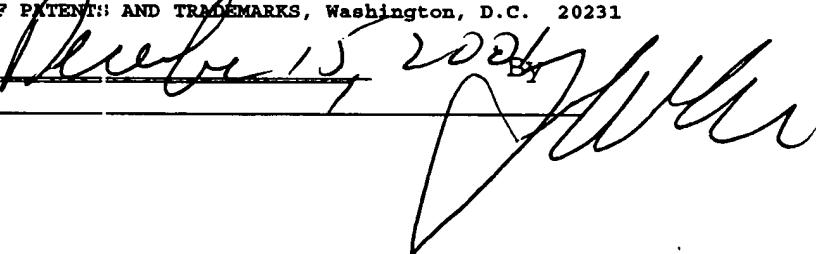
Accordingly, applicants respectfully assert that claims 8-10 are not obvious in view of Rattner, Travanty and Rattner II, for at least the reasons set forth above for the patentability of claim 1, and respectfully request withdrawal of the rejections to these claims under Section 103(a).

Respectfully submitted,

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CERTIFICATE OF MAILING

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On December 15, 2004 By 

The amendment to the first paragraph of page 1 of applicants' specification reads as follows.

The invention relates to an x-ray device [as disclosed in the introductory part of claim 1] provided with an X-ray source and an X-ray detector which are mounted at a respective end of a common holding device, the holding device being connected to the room by way of a supporting device, wherein the supporting device is composed of a plurality of hinged, serially interconnected supporting members.

The amendment to applicants' specification at page four is as follows.

Please amend the first paragraph at page 4 of applicants' Specification to read as follows.

The known X-ray device that is shown in Fig. 1 has a holding device in the form of a C-arm 1 with an X-ray tube 2 and an X-ray detector 3. The tube and the detector are oriented relative to one another in such a manner that X-rays emanating from the X-ray tube 2 along the projection radius P traverse an object to be examined that is arranged on the patient table 4 in the examination zone Z and are incident on the X-ray detector 3. The X-ray tube 2 and the X-ray detector 3 are rotatable about the z₃ axis in the given angular range via rails 11 which are provided on the C-arm 1 and extend through a rail holding system 10. The rail holding system 10 is connected to a rigid supporting device 6 via a hinge 5 that allows a rotation of 315° about the z₂ axis in the case shown. The latter device itself is mounted, via a hinge 7 which enables

rotation about the z_1 axis, on a slide 8 which is displaceable in a system of rails 81 which itself is attached to the ceiling 9. As is already indicated by the angles given, the degree of freedom is limited in such an X-ray device.

Claims 1-10 is amended hereby as follows.

1. (Amended) An X-ray device provided with an X-ray source [(2)] and an X-ray detector [(3)] which are mounted at a respective end of a common holding device [(12)], the holding device [(12)] being connected to the room by way of a supporting device [(18)],
wherein [characterized in that] the supporting device [(18)] is composed of a plurality of hinged, serially interconnected supporting members [(15, 16, 17)].
2. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the supporting device [(18)] is a serial manipulator, notably a robot arm.
3. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the supporting device [(18)] is constructed and connected to the holding device [(12)] in such a manner that the holding device with the X-ray source [(2)] and the X-ray detector [(3)] can be positioned completely as desired.
4. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the motions of the individual supporting members [(15, 16, 17)] of the supporting device [(18)] can be controlled.
5. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the supporting device [(18)] is connected to the holding device [(12)] by way of a hinge [(13)].

6. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the holding device [(12)] is composed of at least two holding members [(19, 20, 21)], the X-ray source [(2)] being mounted on a first holding member [(20)] whereas the X-ray detector [(13)] is mounted on a second holding member [(21)].

7. (Amended) An X-ray device as claimed in claim 1,
wherein [characterized in that] the holding device [(12)] is a C-arm.

8. (Amended) An X-ray device as claimed in claim 1,
such that [characterized in] that there are provided means for monitoring the distance between an object to be examined and moving parts [(2, 3, 12, 18)] of the X-ray device, notably the X-ray source [(2)] and the X-ray detector [(3)].

9. (Amended) An X-ray device as claimed in claim 8,
wherein [characterized in that] the means for monitoring the distance are provided with ultrasound sensors and ultrasound detectors.

10. (Amended) An X-ray device as claimed in claim 8,
wherein [characterized in that] the means for monitoring the distance include mechanical contact sensors.